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$2H_2(g)+O_2(g)= 2H_2O(l)$

△H=□572kJ/mol

$H_2(g)+Cl_2(g)=2HCl(g)$

△H=□184kJ/mol

$2Na(s)+2H_2O(l)=2NaOH(aq)+H_2(g)$ **△H=□368kJ/mol**

□□□：□□□□ △H□0

$2Fe(s)+3/2O_2(g)= Fe_2O_3(s)$ **△H=□824kJ/mol**

E□ >*E*□

$NaOH(aq)+HCl(aq)=NaCl(aq)+H_2O(l)$ **△H=□56kJ/mol**

□□：□□□□□□□□□□□

——□□□

[illegible]——[illegible]

[illegible].

1. [illegible]
2. [illegible]

➢ [illegible]

[illegible] $\triangle$**H > O**

(1) $2NH_4Cl(s)+Ba(OH)_2\cdot 8\,H_2O(s)$

$=NH_3(g)+BaCl_2(s)$

$+10H_2O(l)$

(2) $NaHCO_3(s)+HCl(aq) = NaCl(aq)+CO_2(g)$

$+H_2O(l)$

(3) $2N_2O_5(g) = 4NO_2(g)+O_2\,(g)$

(4) $(NH_4)_2CO_3(s) = NH_4HCO_3(s)+NH_3(g)$

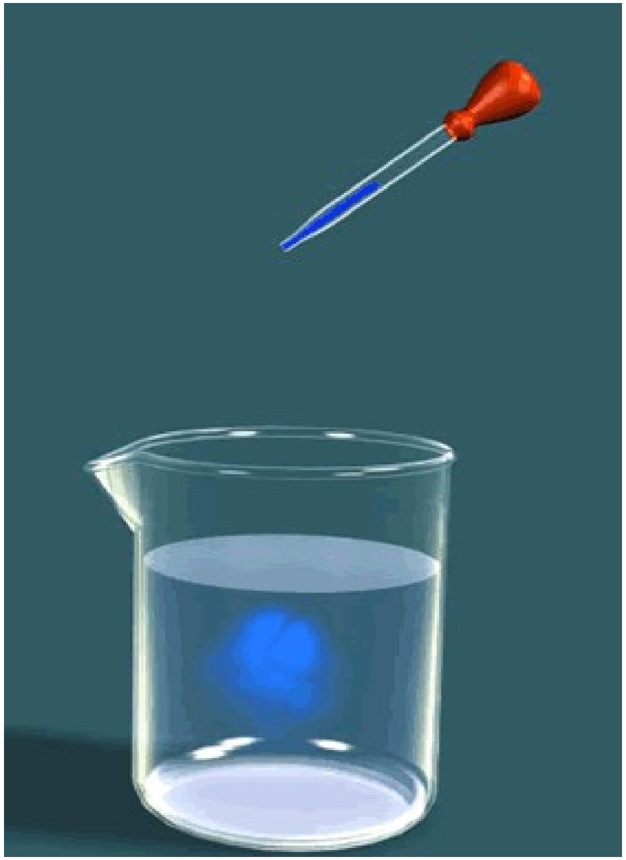
[illegible] $\triangle$**H < 0** [illegible]

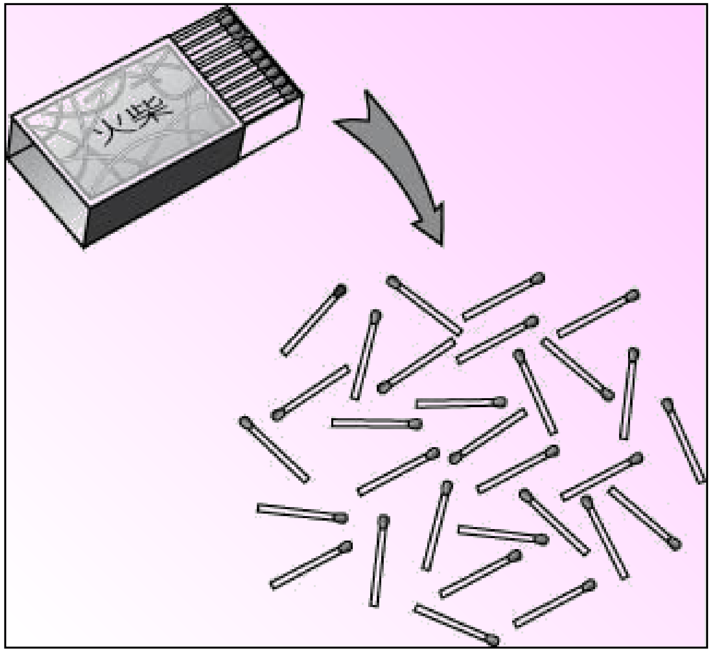
[illegible] $\triangle$**H < 0**

[illegible], [illegible]

[illegible]?

[illegible]




火柴

[illegible]——[illegible]

[illegible] S [illegible]——[illegible]

2 [illegible]△S [illegible]

△S=S [illegible] S [illegible]

△S > 0 [illegible] △S < 0 [illegible]

3 [illegible] △S [illegible] 0 [illegible]

[illegible]

[illegible]

1 [illegible] $S(g)>S(l)>S(s)$

[illegible] —[illegible]→ [illegible] —[illegible]→ [illegible]

2 [illegible] S([illegible])>S([illegible])

3 [illegible]

□□:

$2N_2O_5(g)$ □ $4NO_2(g)+O_2(g)$

$\triangle H=+56.7kJ/mol$

$(NH_4)_2CO_3(s)=NH_4HCO_3(s)+NH_3(g)$ $\triangle H=+74.9$ kJ/mol

□□□□□□□□□□□□□□□□□□□□□□□□□□□

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[illegible]

[illegible] 35: -10°C [illegible]

[illegible]

[illegible] 10℃ [illegible]

[illegible]

——[illegible]

[illegible]:

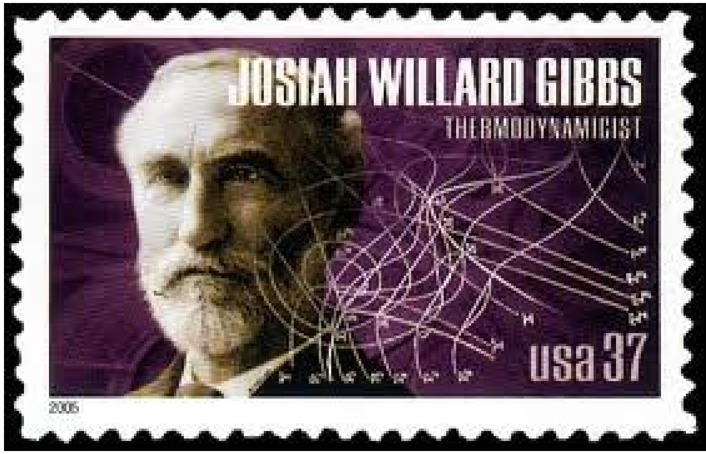
(1) [illegible]

(2) [illegible]

[illegible]△G[illegible]

[illegible]

[illegible]:



(1) $\triangle G = \triangle H - T\triangle S$ ([illegible] G ~ [illegible] T ~ [illegible])

(2) [illegible]

$\triangle G = \triangle H - T\triangle S$ [illegible] 0 [illegible]

$\triangle G = \triangle H - T\triangle S$ [illegible] 0 [illegible]

$\triangle G = \triangle H - T\triangle S$ [illegible] 0 [illegible]

$\triangle G = \triangle H - T\triangle S$ [illegible] 0

① △H [illegible] 0 [illegible] △S [illegible] 0 [illegible] △G [illegible] 0 [illegible]

② △H [illegible] 0 [illegible] △S [illegible] 0 [illegible] △G [illegible] 0 [illegible]

③ △H [illegible] 0 [illegible] △S [illegible] 0 [illegible]

④ △H [illegible] 0 [illegible] △S [illegible] 0 [illegible]

1 [illegible] 25°C [illegible] 1.01×10^5Pa [illegible]

$2N_2O_5(g)=4NO_2(g)+O_2(g)$ [illegible]

$\triangle H=+56.76kJ/mol$ [illegible] **D**

[illegible]:[illegible] [illegible]

A [illegible] B [illegible]

C [illegible] D [illegible]

2 [illegible] **298K** [illegible] $CaCO_3(S)=CaO(S)$

$+CO_2(g)$ [illegible]

$\triangle H=+178.2$ kJ/mol [illegible] $\triangle S=169.6\ J\cdot mol^{-1}\cdot K^{-1}$ [illegible]

$\triangle G = \triangle H - T\triangle S$

$= 178.2kJ/mol - 298K\times169.6\times10^{-3}\ KJ\cdot mol^{-1}\cdot K^{-1}$

$= 127.7kJ/mol > 0$

[illegible]

[illegible]

[illegible]

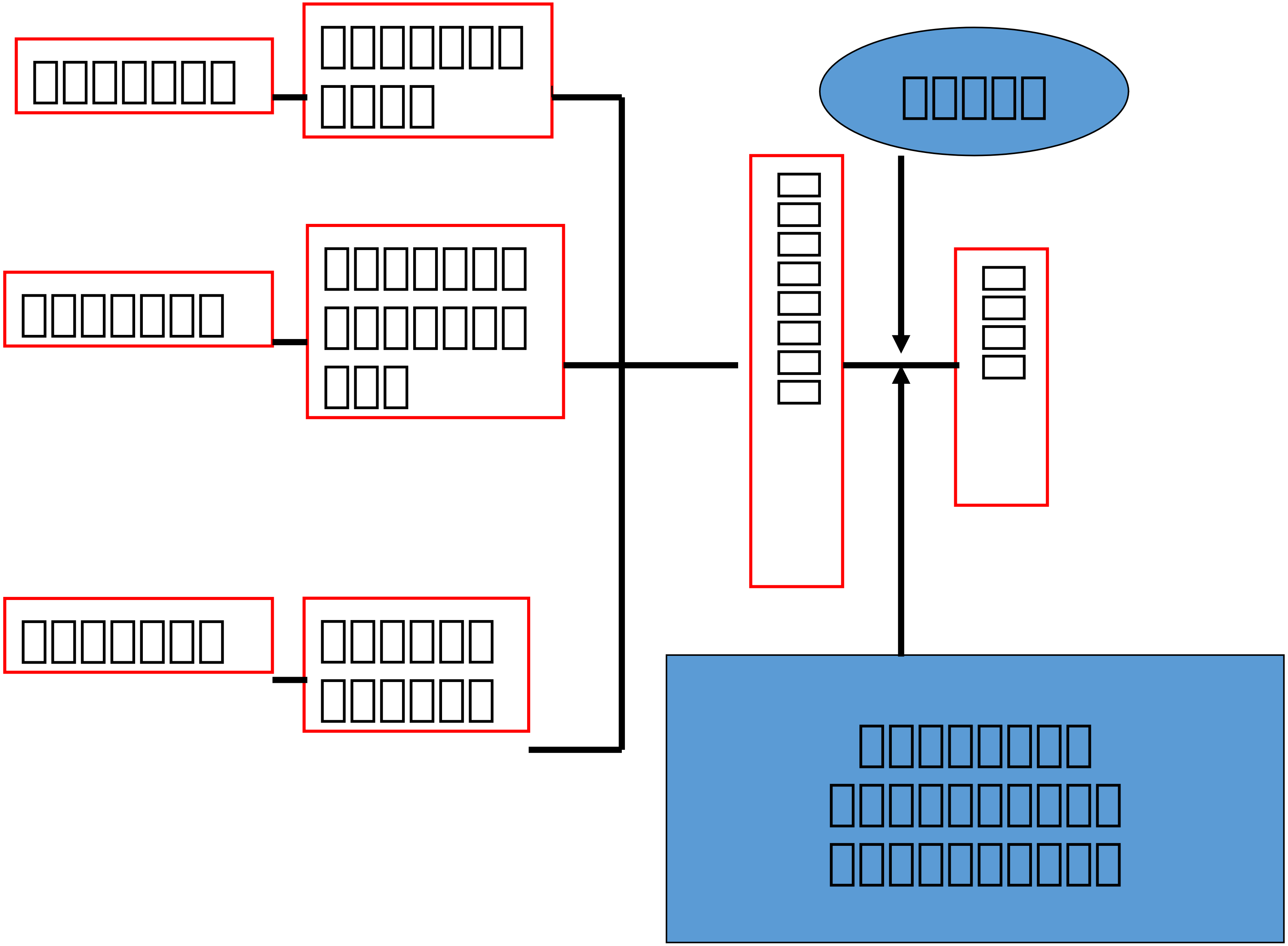
[illegible]

[illegible] → [illegible]

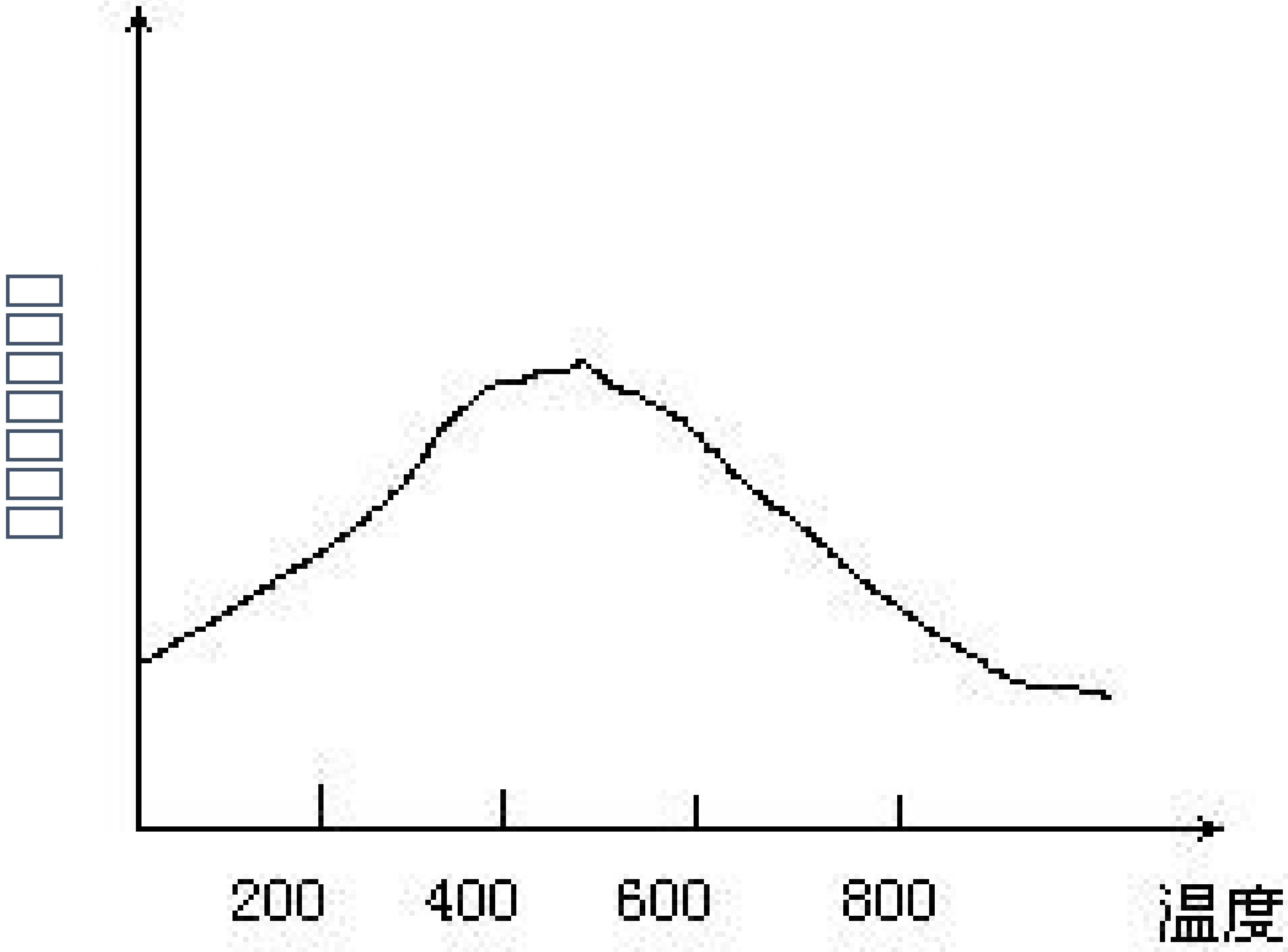
[illegible] → [illegible]

[illegible]

[illegible]



$$N_2 + 3H_2 \underset{\text{催化剂}}{\overset{\text{高温高压}}{\rightleftharpoons}} 2NH_3$$



200
400
600
800
温度

[illegible]

[illegible]	[illegible]
[illegible]	[illegible] 20~50MPa [illegible]
[illegible]	700K [illegible] 400-450°C [illegible]
[illegible]	[illegible]
[illegible]	[illegible] [$n(N_2):n(H_2)=1:2.8$]

[illegible]

1 [illegible]

[illegible] N_2 [illegible] H_2 [illegible]

$$CH_4(g)+H_2O(g) \rightleftharpoons CO(g)+3H_2(g)$$

$$CO(g)+H_2O(g) \rightleftharpoons CO_2(g)+H_2(g)$$

2 [illegible]

[illegible]

3 [illegible]

[illegible]